CLAIMS

What is claimed is:

5   1   A method for verifying collision detection and resolution in a home network, the

home network comprising a plurality of stations wherein each station includes a

host media access controller program and a media access controller, the method

comprising the steps of:

(a)   transmitting a frame when a transmission channel is inactive;

10   (b)   when a collision is detected,

(i)   ceasing transmission of the frame,

(ii)   choosing a backoff level,

(iii)   incrementing a backoff level counter in response to receiving

backoff signal from another station on the network,

15   (iv)   decrementing the backoff counter in response to successfully

transmitting the frame; and

(c)   accessing the backoff level counter through the host media access

controller such that collision resolution can be monitored without

snooping signals over the network.

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2   The method of claim 1 wherein step (a) further includes the step of deferring

transmission of a frame when the transmission channel is active.

3 The method of claim 2 wherein step (a) further includes the step of transmitting a frame in one of a plurality of priority slots;

4 The method of claim 3 wherein step (a) further includes the step of maintaining a first and second backoff level counters for each of the priority slots.

5 The method of claim 4 wherein step (a) further includes the step of initializing the first and second backoff level counters to zero after a reset.

6 The method of claim 5 wherein step (b)(ii) further includes the step of randomly choosing a backoff level by choosing backoff level signal slot and transmitting a backoff signal in that slot.

7 The method of claim 6 wherein step (b)(iii) further includes the step of incrementing the first backoff level counter in response to receiving backoff signal from another station on the network.

8 The method of claim 7 wherein step (b)(iv) further includes the step of in response to detecting a backoff signal in a slot prior to the backoff level signal slot chosen, increasing the backoff level by incrementing the second backoff level counter.

9 The method of claim 8 wherein step (b)(iv) further includes the step of:

(1)   when any station successfully transmits a frame, reducing the backoff level by one by decrementing the second backoff level counter if it is greater than zero, and

(2)   when the second backoff level counter reaches zero transmitting the frame of the network.

10 The method of claim 4 further including the step of maintaining the first and second backoff level counters as 4-bit register type memories in the MAC.

11 A method for verifying collision detection and resolution in a home network, the home network comprising a plurality of stations wherein each station includes a host media access controller program and a media access controller, the method comprising the steps of:

(a)   transmitting a frame in one of a plurality of priority slots;

(b)   providing the media access controller with at least one backoff level counter for each of the priority slots;

(c)   in response to detecting a frame collision, ceasing transmission;

(d)   resolving the collision by

(i)   randomly choosing one from among a plurality of backoff level slots,

(ii)   transmitting a backoff signal in that slot; and

(iii)   monitoring the backoff level slots and incrementing the backoff

level counter for each backoff signal detected, and decrementing the backoff level counter after a successful transmission, whereby transmission is deferred to stations having a lower backoff level count; and

5   (e)   accessing the backoff level counters from the host media access controller program to verify that collision resolution is operating as intended, thereby eliminating the need to snoop signals over the network.

10   12   The method of claim 11 wherein step (b) further includes the step of maintaining a first and second backoff level counters for each of the priority slots.

13 The method of claim 12 wherein step (d)(iii) further includes the step of incrementing the first backoff level counter in response to receiving backoff signal from another station on the network.

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14 The method of claim 13 wherein step (d)(iii) further includes the step of in response to detecting a backoff signal in a slot prior to the backoff level signal slot chosen, increasing the backoff level by incrementing the second backoff level counter.

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15 The method of claim 14 wherein step (d)(iii) further includes the step of:

      (1)   when any station successfully transmits a frame,

reducing the backoff level by one by decrementing the

second backoff level counter if it is greater than zero,

and

(2) when the second backoff level counter reaches zero

transmitting the frame of the network.

16 A home network comprising a plurality of stations, wherein each station

comprises,

a control chip for implementing a home phoneline network alliance specification, the

control chip including,

a plurality of backoff level registers accessible by the host media

access controller program, and

a media access controller (MAC), the MAC further including,

a Transmit Data Path for transmitting frames of the network,

each frame assigned a priority level that the first transmission of the

frame to a slot corresponding to the priority level, wherein the frame is

transmitted when a carrier sense signal is inactive, and transmission

of the frame is suspended when a collision is detected,

a Distributed Fair Priority Queuing (DFPQ) for resolving frame

collisions by choosing one of a plurality of backoff levels and deferring

to stations that have chosen a lower backoff level, incrementing the

backoff level counter when a backoff level signal is received from

another station on the network, and once the station completes a

transmission, reducing the backoff level by decrementing the backoff level counter, such that when the counter reaches zero the MAC transmits the frame; and

a host media access controller program in communication with the MAC for accessing the backoff level counter to verify that collision detection and resolution are operating, thereby eliminating the need to snoop signals over the home network.

17 The home network of claim 16 wherein frame transmission deferral is ordered by up to 8 priority levels.

18 The home network of claim 17 wherein there are three backoff levels.

19 The home network of claim 18 wherein the MAC includes one maximum backoff level counter and one backoff level counter for each of the priority levels.

20 The home network of claim 19 wherein the maximum backoff level counter indicates a number of backoff level signals received over the home network, and wherein the backoff level counter indicates the backoff level of the corresponding station.

21 The home network of claim 20 wherein the maximum backoff level counter and the backoff level counter are part of the MAC.

22 A method for verifying collision detection and resolution in a home network, the home network comprising a plurality of stations wherein each station includes a host media access controller program and a media access controller (MAC), wherein the MAC transmits frames in one of a plurality of priority slots, the method comprising the steps of:

(a)   maintaining a first and second backoff level counters for each of the priority slots;

(b)   initializing the first and second backoff level counters to zero after a reset;

(c)   when a conflict is detected, randomly choosing a backoff level signal slot and transmitting a backoff signal in that slot;

(d)   monitoring collision events and the backoff level signal slots;

(e)   incrementing the first backoff level counter in response to receiving backoff signal from another station on the network to indicate a total number of backoff signals received;

(f)   decrementing the first backoff counter in response to successfully transmitting the frame to reduce a backoff level;

(g)   in response to detecting a backoff signal in a slot prior to the backoff level signal slot chosen, increasing the backoff level by incrementing the second backoff level counter;

(h)   when any station successfully transmits a frame, reducing the backoff level by one by decrementing the second backoff level counter if it is greater than zero;

(i)   when the second backoff level counter reaches zero, transmitting the frame over the network; and

(j)   monitoring and diagnosing the home network by reading first and second backoff level counters through the host media access controller program to verify that collision detection and resolution are operating as intended, thus eliminating the need to snoop signals over the network.

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